

BEAN ROAD TUNNELS, BLUEWATER 2018-2020

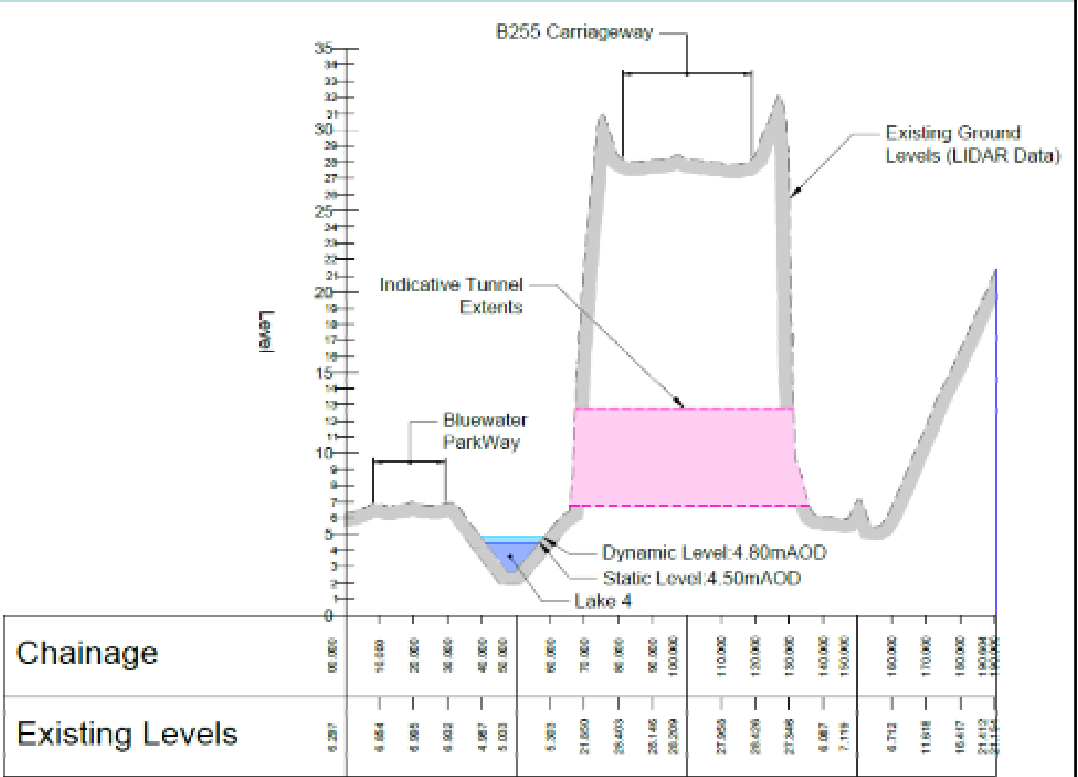
Bean Road Tunnels, Bluewater – Proposed Bus Route and Cycle/Pedestrian Tunnels



Bean Road Tunnels, Bluewater - Existing Haulage Roads once used by Blue Circle (Lafarge)



Bean Road Tunnels, Bluewater – Proposed Bus Route and Cycle/Pedestrian Tunnels



Option Study undertaken by Halcrow 2018-2020

Bean Road Tunnels, Bluewater : Existing Haulage Tunnels (Eastern Quarry Side)



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Bean Road Tunnels, Bluewater – Existing Tunnels

The tunnels were designed for a 10-year design life, an internal diameter of 6.2m high by 6.8m wide and excavated in two cuts: top heading and bench. A 200mm thick sprayed concrete lining was applied with welded wire mesh and lattice girders

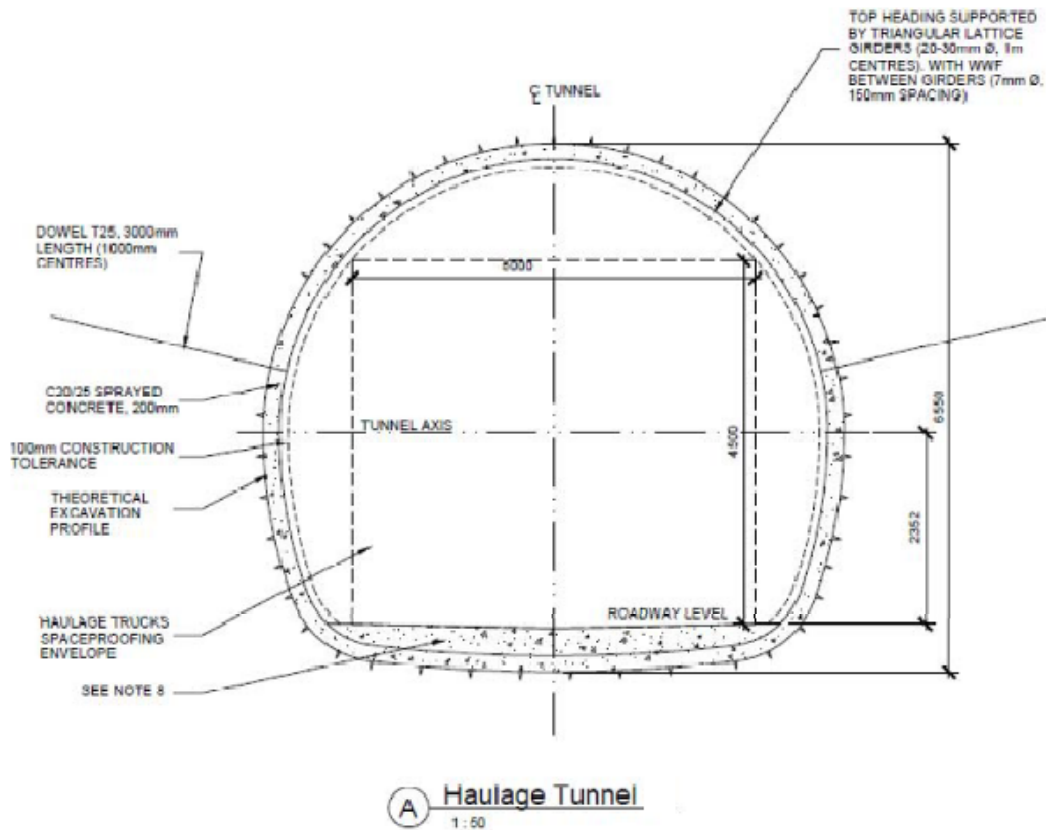


Figure 3 - Existing Haulage Tunnel, Spaceproofing Cross Section

Bean Road Tunnels, Bluewater : Construction of the Existing Tunnels



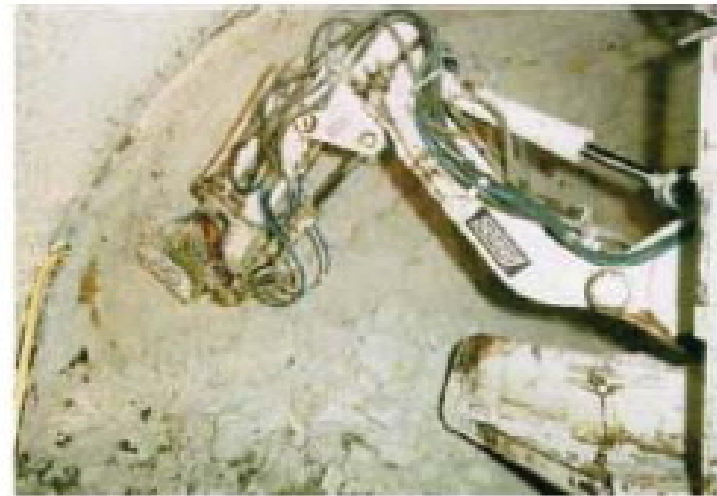
Canopies & marking out of tunnel portals



Portal wiremesh & shotcrete



Start of excavation



Excavation of chalk face

Bean Road Tunnels, Bluewater : Existing Northern Haulage Tunnel



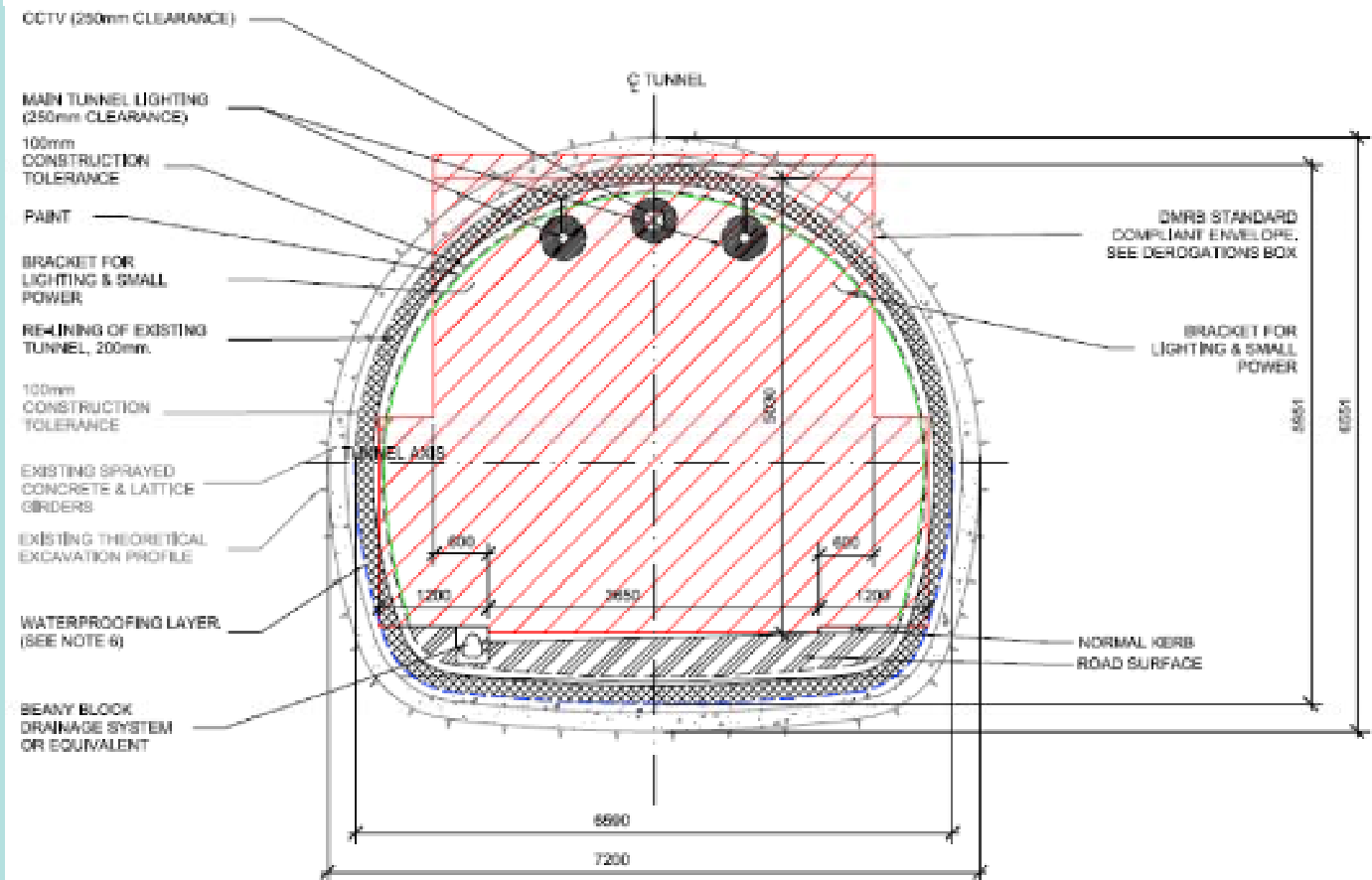
Inside northern former
haulage tunnel (facing east)

Tunnel A – Signal-controlled bus route

- Anticipated refurbished tunnel too small for bus according to DMRB standards
- Some enlargement of the tunnel would be necessary (could involve lowering of invert and/or lifting of the crown)
- However this would be more difficult if the tunnel vertical alignment is to change

Based on the DMRB standards, the spaceproofing requirements for this Fast-Track bus tunnel would consist of the following standard requirements:

- Single lane carriageway, 3650mm (wide) by 5300mm (high);
- Additional height allowance of 250mm above carriageway to any M&E service;
- Verges on both sides, 1200mm (wide) by 2030mm (high);
- Full height is only maintained over the first 600mm of the verge;

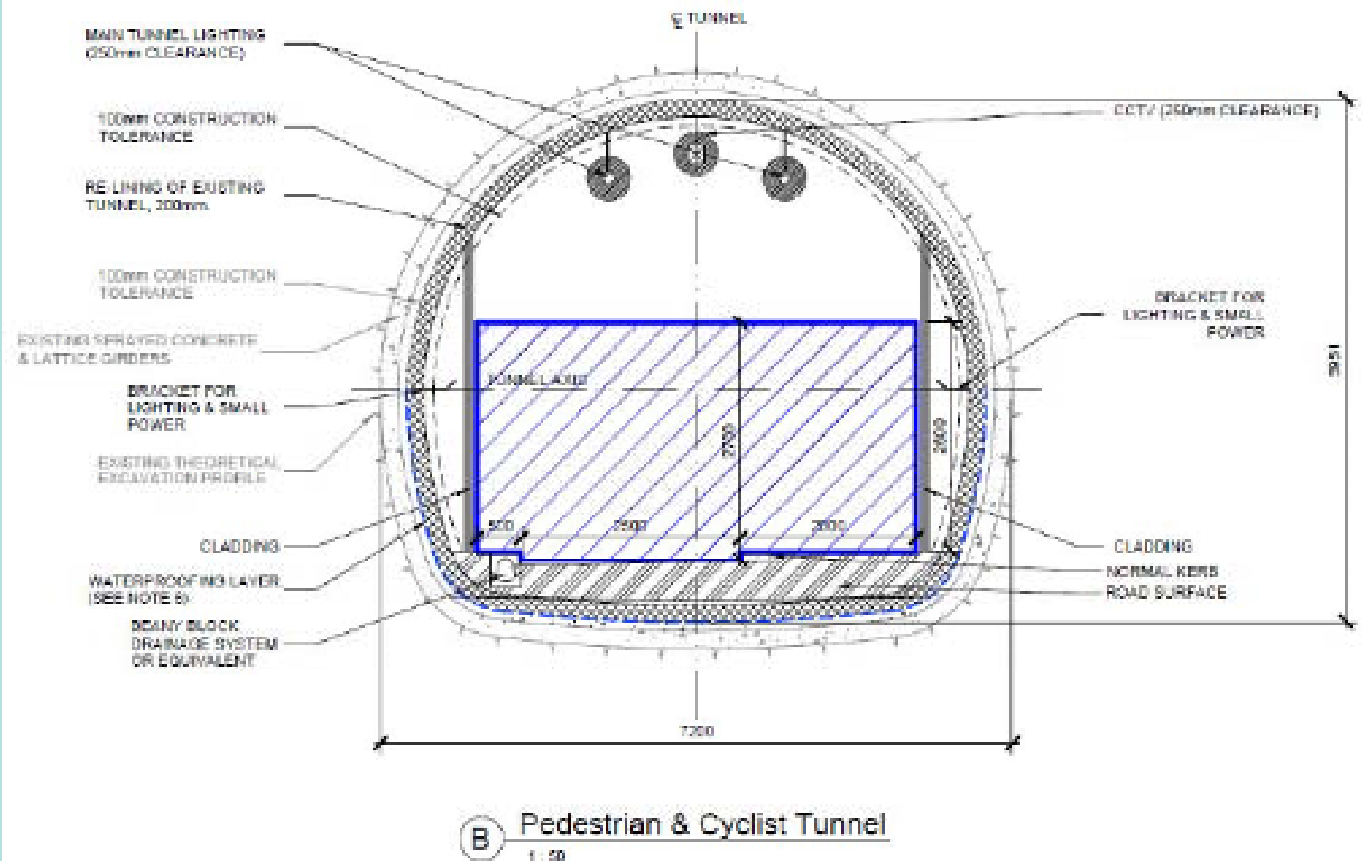


Tunnel B – Mixed-use cyclist and pedestrian tunnel

- Not so much of a problem as the proposed use fits with the anticipated refurb envelope
- Ambience and environment need to be considered carefully (especially air flow)

Based on the DMRB standards, the spaceproofing requirements for this mixed-use pedestrian & cyclist tunnel would consist of the following standard requirements:

- *Cyclist track, 2500mm (wide) by 2700mm (high);*
- *Footpath, 2000mm (wide) by 2600mm (high);*



Following review decided to construct a new tunnel and adopt the existing north tunnel for cycle and pedestrian access

Eastern Quarry Side



Survey of Chalk Cliff carried out on both Eastern Quarry and Bluewater sides to determine Seaford Chalk lithology, the CIRIA Grade, location of flint horizons and nature and trends of discontinuities. Photo of chalk cliff Eastern Quarry Side. This was to be supplemented by investigations (e.g. dynamic cone, trial pits, boreholes...)

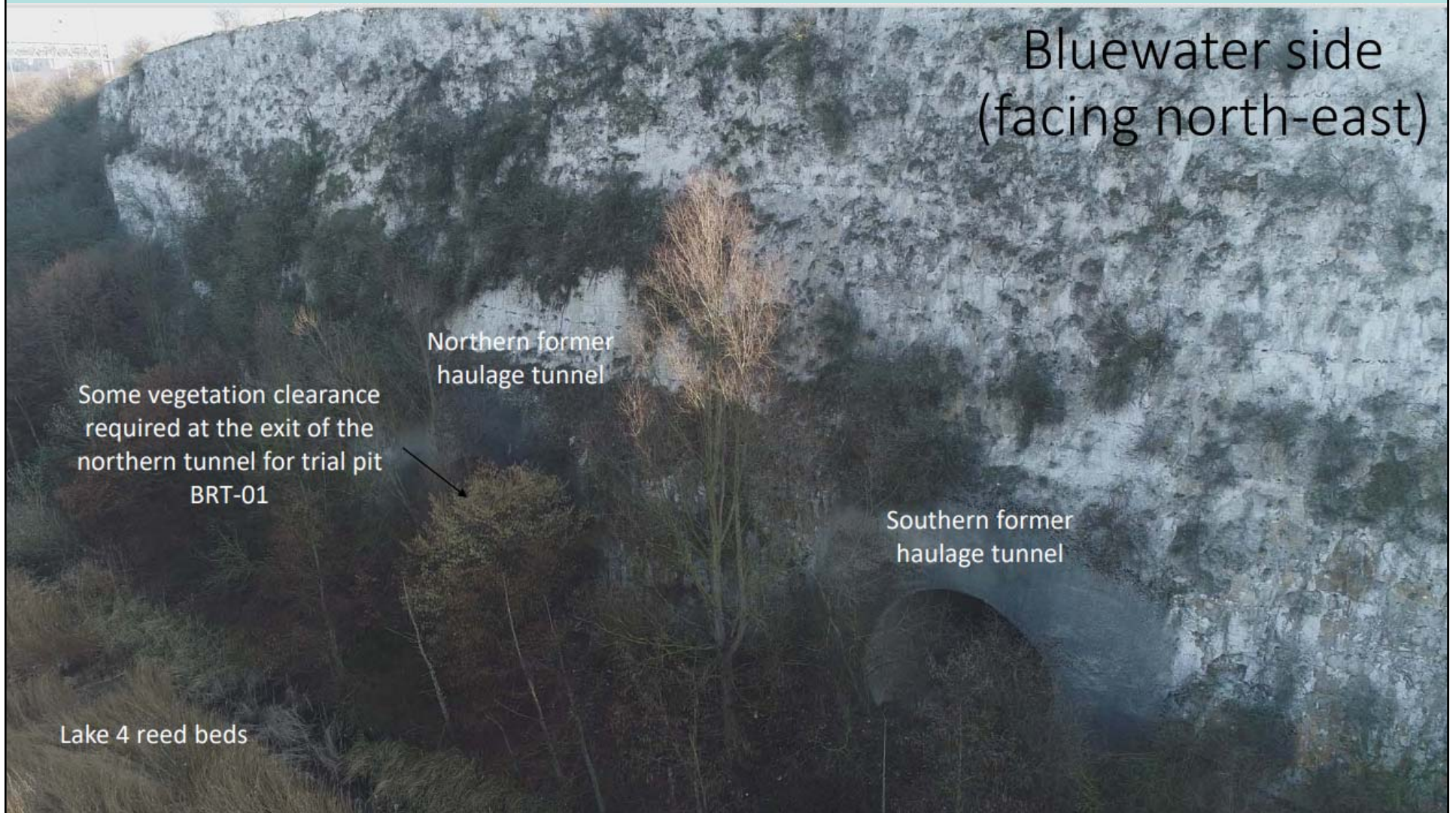
Highly vegetated areas



New Tunnel
12 m dia

Highly vegetated areas of the face are difficult to assess. Only reasonable assumptions can be made. It can be assumed that the rock is more fractured than in other area allowing the growth of plants roots, but it cannot be confirmed.

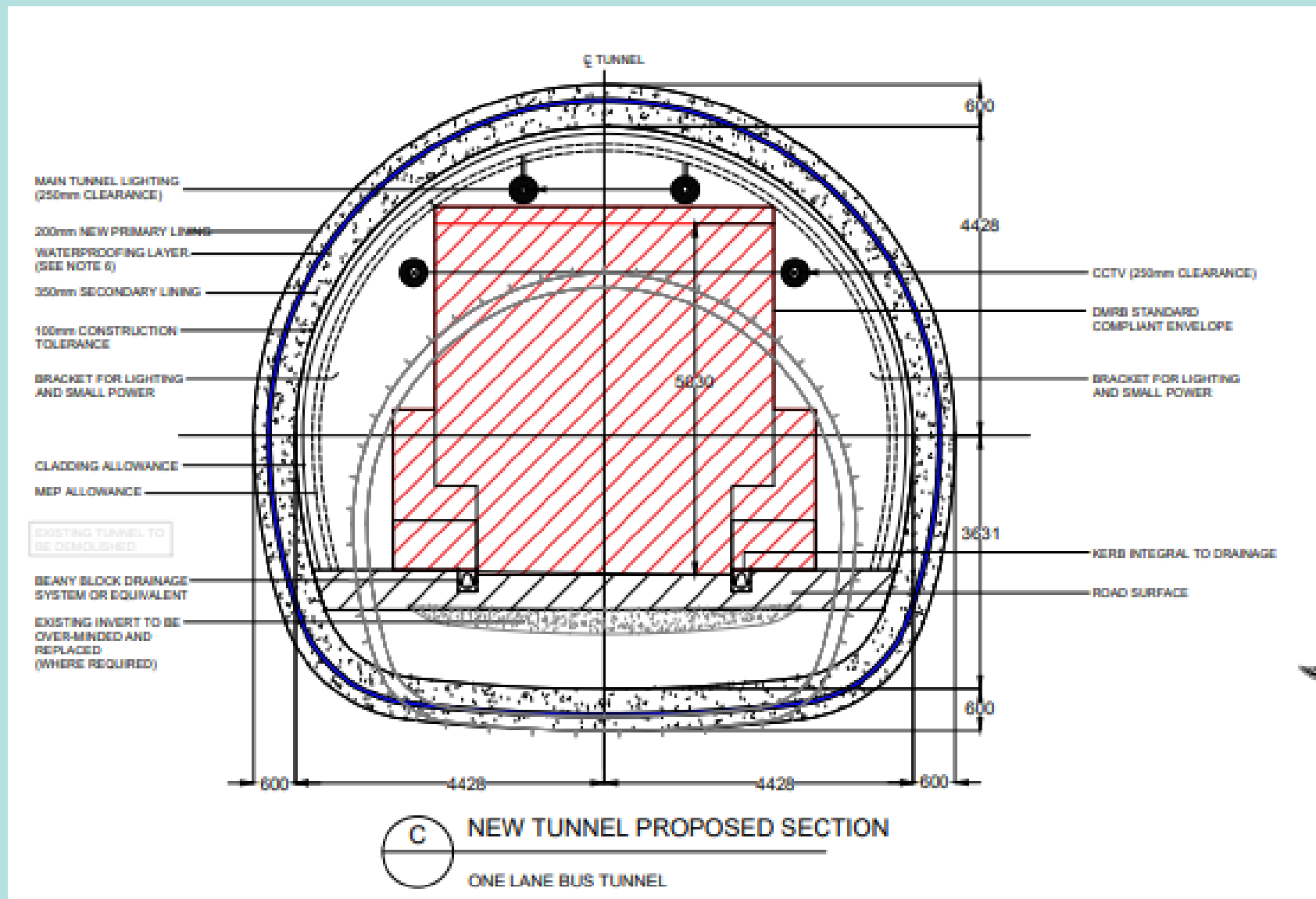
Increased vegetation and weathering of exposed chalk on Bluewater side.
Presence of important Lake 4 reed beds along downstream toe of cliff



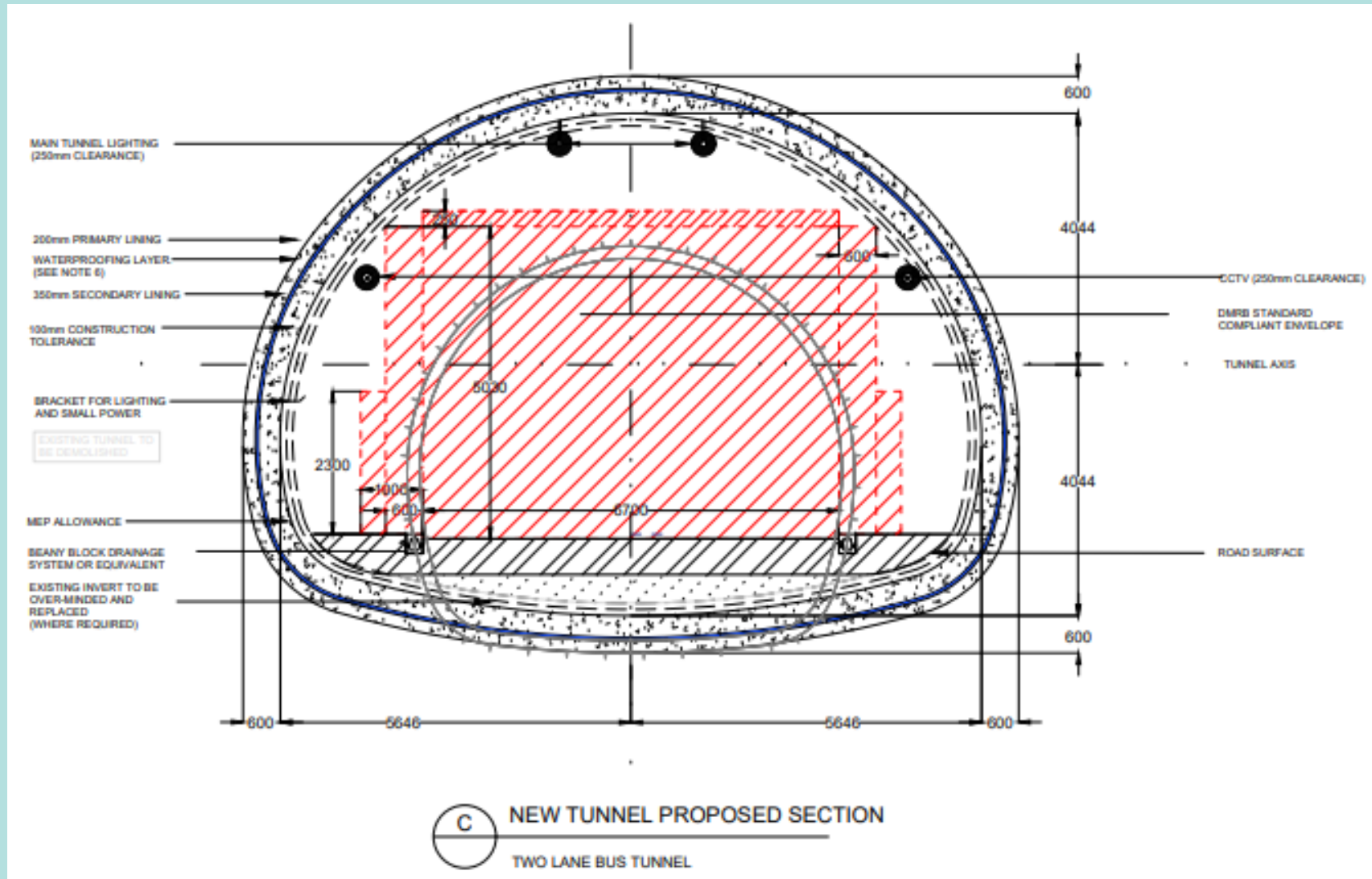
Option : Construction of a New Single/Dual Bus Lane Tunnel with Cycle and Pedestrian Access in Refurbished Existing Northern Haulage Tunnel



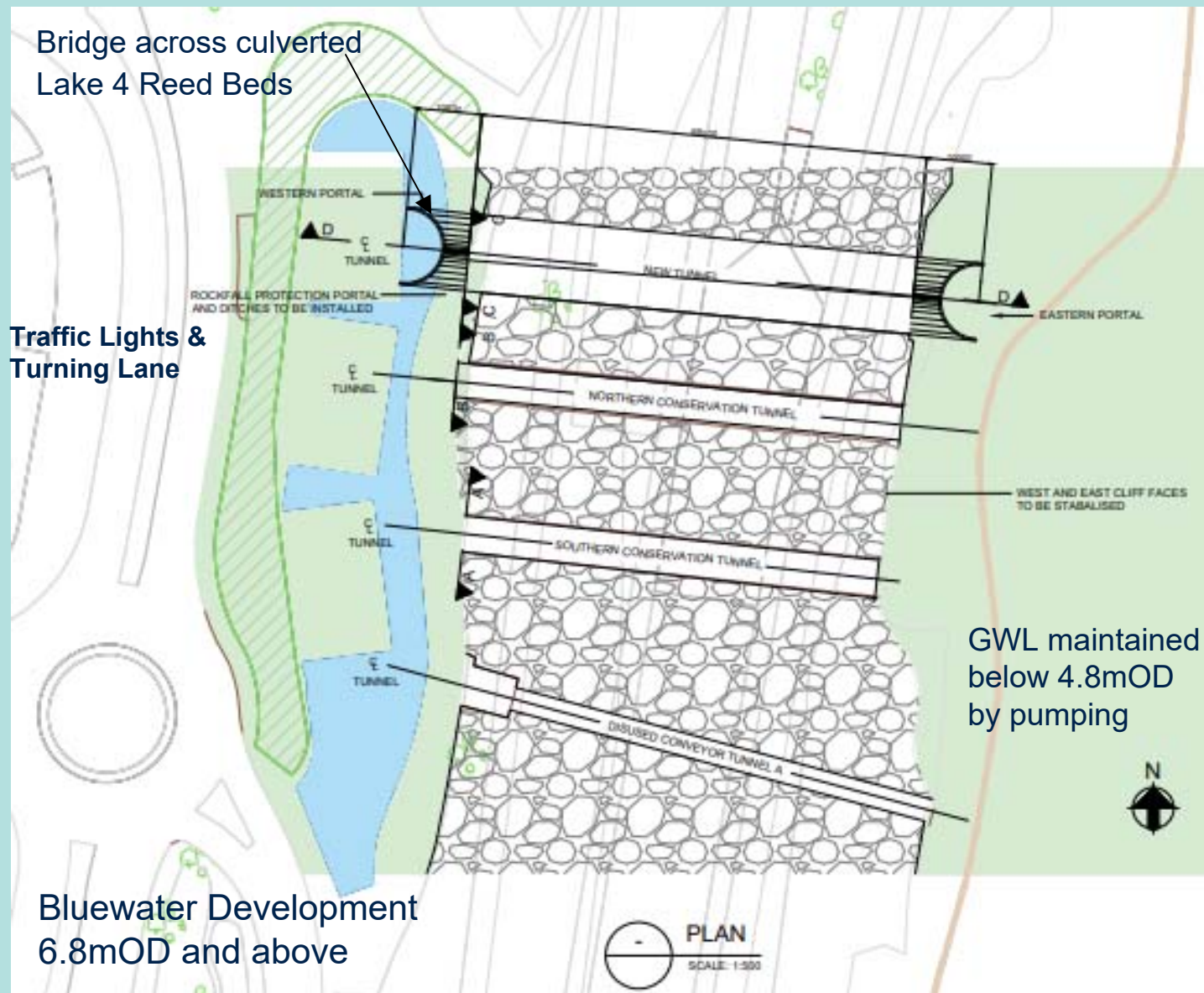
Option 1 – Construction of a New Single Bus Lane Tunnel 9.3m High by 10.1m Wide



Option 2 – Construction of a New Two Lane Bus Tunnel 9.3m High by 12.5m Wide



Preferred Option 3 : Construction New Single Bus Lane Tunnel with Segregated Cycle and Pedestrian Routes either side of bus lane. New Tunnel 9m High by 11.8m Wide



Option 3 : Construction New Single Bus Lane Tunnel with Segregated Pedestrian and Cycle Routes either side of bus lane. New Tunnel 9m High by 11.8m Wide

